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CLAIMS

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[Utility model registration claim]

[Claim 1] While comparing with the tape supporter which is the masking tape attachment machine which sticks a masking tape on a printed circuit board, and supports a roll-like masking tape possible [ rotation ] in the tape attachment direction and being arranged The masking tape which could go up and down individually and it let out Two tape presser-foot rollers in which forcing to a printed circuit board is possible, The cutter which performs tape cutting operation after being located between the two aforementioned tape presser-foot rollers, the tape presser-foot roller by the side of a tape supporter being in an elevation position and the tape presser-foot roller of another side having pressed down the masking tape, The aforementioned tape supporter, two tape presser-foot rollers, the masking tape attachment machine characterized by having a move means to move the whole cutter in the tape attachment direction.

[Claim 2] The masking tape attachment machine according to claim 1 characterized by having arranged in parallel the head equipped with the aforementioned tape supporter, two tape presser-foot rollers, and tape cutters in the tape attachment direction and the direction which intersects perpendicularly, and preparing them. [ two or more ]

[Claim 3] The masking tape attachment machine according to claim 2 characterized by preparing two or more aforementioned heads possible [ rotation ] up and down focusing on the end section of the tape delivery direction individually, respectively.

[Claim 4] The masking tape attachment machine according to claim 3 characterized by having the means perpendicularly stood so that each head may be rotated and the tape supporter side may turn up, in case the aforementioned head is equipped with a roll-like masking tape.

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DETAILED DESCRIPTION

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[Detailed explanation of a design]

[0001]

[Industrial Application]

This design is related with the masking tape attachment machine which sticks a masking tape on a printed circuit board automatically.

[0002]

[Description of the Prior Art]

In case electronic parts are carried and soldered to a printed circuit board, some parts may be post-installed for the reason for avoiding problems, such as curvature of the printed circuit board when attaching the riser of the flux to the parts which have a contact, or the parts which become weight size, etc. In order to prevent that the hole of a printed circuit board is closed with solder in that case, sticking a masking tape on a part for the hole of the part to post-install is performed. A masking tape is an adhesive tape which applied the binder to one side. Conventionally, this tape \*\*\*\* work prepared the short length tape of the predetermined length cut from the roll-like masking tape by the help, using a tool 1 like drawing 6, and was sticking every one sheet of this prepared short length tape on the printed circuit board by the help. In case it is made to adhere to the periphery of the circular section 4 which can rotate cut short length tape 2a and is stuck on a printed circuit board, the aforementioned tool 1 cutting the nose of cam of the roll-like tape 2 in through and its upper part in the hollow object 3, it takes by hand short length tape 2a prepared for this tool 1, and sticks it on a printed circuit board.

[0003]

[Problem(s) to be Solved by the Device]

Although the working capacity of the method of performing with a help altogether is low of course, since great difference hardly as a help performing, the equipment which does tape attachment work automatically and efficiently is called for also by the method using the tool 1 of drawing 6. However, that tape attachment work is thin and an object is difficult for it to handling, and since it adheres, the automation in which the practical use is possible was difficult.

[0004]

This design was made in view of the above-mentioned situation, and aims at offering the masking

tape attachment machine which can do automatically and efficiently the attachment work of the masking tape to a printed circuit board.

[0005]

[Means for Solving the Problem]

The tape supporter which this design which solves the above-mentioned technical problem is a masking tape attachment machine which sticks a masking tape on a printed circuit board, and supports a roll-like masking tape possible [ rotation ]. While being arranged and arranged in the tape attachment direction, it can go up and down individually. And the cutter which performs tape cutting operation after being located between the two aforementioned tape presser-foot rollers which it let out, the tape presser-foot roller by the side of a tape supporter being in an elevation position and the tape presser-foot roller of another side having pressed down the masking tape. It is characterized by having a move means to move the aforementioned tape supporter, two tape presser-foot rollers, and the whole cutter in the tape attachment direction.

[0006]

[Function]

In the above-mentioned composition, it lets out a masking tape from a tape supporter so that two tape presser-foot rollers may be contacted. At the time of tape attachment, two tape presser-foot rollers move a masking tape in the state where it pushed on the printed circuit board, and tape attachment is performed at it. In this case, a tape supporter and a cutter also move to a tape presser-foot roller and one. After one tape presser-foot roller pressed down the masking tape at the time of tape cutting and the tape presser-foot roller of another side has gone up, a cutter descends, and a masking tape is cut. This operation is repeated and the tape attachment work of a desired part on a printed circuit board is done.

[0007] [Example]

Hereafter, one example of this design is explained with reference to drawing 1 - drawing 5 . Drawing 1 is the perspective diagram of the masking tape attachment machine 10 of one example of this design. This masking tape attachment machine 10 is equipped with the turntable 13 which puts a printed circuit board 12 on the upper surface of the main part 11 of equipment. Sign 13a is a stopper for printed circuit board positioning. This turntable 13 is for making it correspond to it, when the tape attachment direction on a printed circuit board 12 changes.

[0008]

Four heads 14 which perform tape attachment are formed above the aforementioned turntable 13. It is fixed to the front end of moving part 16, and the support frame 15 which supports four heads 14 can slide the movable base 17 top to the cross direction (the direction of X) of the main part 11 of equipment, and drives moving part 16 to a cross direction by the motor 18. The aforementioned movable base 17 is movable to a longitudinal direction (the direction of Y) along with the rail 19 of fixation, and is driven to a longitudinal direction by the motor 20. A sign 21 is a control panel and arranges various buttons, the key, etc. A sign 22 is an input unit for inputting in advance the tape attachment part on a printed circuit board, the tape length which should be stuck.

[0009]

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The detail of the aforementioned head 14 is shown in drawing 2. Each head 14 is equipped with the movable plate 26 attached in the vertical direction possible [ rotation ] through the pin 25 at supporter 15a of the support frame 15. The point of a movable plate 26 is caught by movable-plate receptacle 15b of the support frame 15. Movable-plate receptacle 15b is equipped with guide plate 15c which prevents \*\*\*\* of right and left of a movable plate 26 as shown in drawing 4. The reel shaft 27 which is a tape supporter and which can be rotated is attached in a movable plate 26 at right angles to the tape attachment direction (longitudinal direction of drawing 2), and this reel shaft 27 is equipped with the roll-like masking tape 28. The 1st idler 29 to which it shows the masking tape which it lets out from the reel shaft 27 is attached in the movable plate 26.

[0010]

The 1st tape presser-foot roller 31 and the 2nd tape presser-foot roller 32 are attached in the roller electrode holder 33 together with the tape attachment direction. The tape presser-foot roller 31 by the side of the reel shaft 27 is supported possible [ rise and fall ] by the toggle mechanism 35 which operates by the pneumatic cylinder 34. the tape presser-foot roller 32 of another side is attached in the cylinder rod of a pneumatic cylinder 38. and a rise-and-fall drive is carried out. Moreover, the 2nd idler 40 attached in the member 39 fixed to the roller electrode holder 33 between the 1st idler 29 of the above and the 1st tape presser-foot roller 31 is arranged. The point of the masking tape 28 on the reel shaft 27 is guided by the 1st idler 29 and the 2nd idler 40, and is led to the 1st tape presser-foot roller 31. The tape cutter 41 is arranged between the 1st tape presser-foot roller 31 and the 2nd tape presser-foot roller 32. A tape cutter 41 is driven up and down by the pneumatic cylinder 42. The aforementioned pneumatic cylinders 34, 38, and 42 are attached in the movable plate 26 by each. Moreover, the pin portion of a upper limit is attached in the movable plate 26 also for the aforementioned toggle mechanism 35. The aforementioned roller electrode holder 33 consists of side plate 33b of the right and left fixed to main part of electrode holder 33a, and this main part of electrode holder 33a, as shown in drawing 3, and two tape presser-foot rollers 31 and 32 are supported by side plate 33b possible [ rotation ]. Moreover, the inferior surface of tongue of slit 33c which lets the aforementioned tape cutter 41 pass, and main part of electrode holder 33a is equipped with vacuum suction mouth 43a for adsorbing a masking tape, and vacuum suction hose 43b connected to the vacuum pump of the illustration abbreviation with this vacuum suction mouth 43a is connected to main part of electrode holder 33a.

[0011]

Moreover, the cylinder supporter material 46 is attached in the supporter 15a side of the support frame 15 possible [ 90 degree rotation ] through the hinge 45 for a lift rise at the time of tape wearing, the pneumatic cylinder 47 for a lift rise is attached in this cylinder supporter material 46 at the time of tape un-using it, and the nose of cam of cylinder rod 47a of this pneumatic cylinder 47 is connected with the aforementioned movable plate 26. the lock whose sign 48 locks the cylinder supporter material 46 into the perpendicular posture which is in the state at the time of tape attachment operation -- it is a member

[0012]

Next, tape attachment operation by the above-mentioned masking tape attachment machine 10 is

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explained with reference to each above-mentioned drawing and above-mentioned drawing 5 . Drawing 2 and the drawing 5 (b) are in the state which stuck on the predetermined attachment part on a printed circuit board 12 the masking tape 28 which it let out from the reel shaft 27. In this state both, two tape presser-foot rollers 31 and 32 have pushed the masking tape 28 against the printed circuit board 12, and a tape cutter 41 is in an elevation position. Here, as a pneumatic cylinder 34 operates and the 1st tape presser-foot roller 31 shows the drawing 5 (b) through a toggle mechanism 35, it goes up, then a pneumatic cylinder 42 drops a tape cutter 41, and a masking tape 28 is cut. Then, vacuum suction of the tape nose of cam is carried out by vacuum suction mouth 43a at the same time a tape cutter 41 goes up, as shown in the drawing 5 (c). A position gap of a tape nose of cam is prevented by this vacuum suction. Then, as shown in the drawing 5 (d), a head 14 moves in the direction of arrow a, and the non-attachment portion of the separated masking tape is forced and stuck on a printed circuit board 12 with the 2nd tape presser-foot roller 32. Thereby, tape attachment operation about one place is completed. In addition, movement of a head 14 operates a motor 20 in drawing 1 , and is performed by making the movable base 17 and one move moving part 16 to a longitudinal direction (the direction of Y).

[0013]

Then, although a head 14 moves to the tape attachment position of a degree, vacuum suction is stopped, while the 1st tape presser-foot roller 31 descends and the 2nd tape presser-foot roller 32 goes up, as shown in the drawing 5 (e), when the tape presser-foot rollers 31 and 32 of a head 14 come to the predetermined position corresponding to the tape attachment position of a degree. After a head 14 moves in the direction of arrow a further from the state of being the drawing 5 (\*\*) (only  $L + \alpha$  (however, distance according to the tape length which  $\alpha$  should stick) makes it move when setting distance between two tape presser-foot rollers 31 and 32 to L), the 2nd tape presser-foot roller 32 descends ( drawing 5 (\*\*) reference). The state of this drawing 5 (\*\*) is equivalent to the state of the drawing 5 (b). Therefore, tape attachment operation to two or more tape attachment parts on a straight line can be performed by repeating operation of the above-mentioned drawing 5 (b) - a (\*\*). In addition, above-mentioned explanation is tape attachment operation by one head 14.

[0014]

Each four heads 14 can be located in the position of a request of the cross direction on a printed circuit board 12 by \*\* which drives moving part 16 to a cross direction (the direction of X) on the movable base 17 by the operation of a motor 18. The selection which can also perform tape attachment operation simultaneously in parallel if a tape attachment part suits, and presupposes un-using the head 14 of a part of use for some heads 14 is also possible for each of these four heads 14. Head use the selection which is not used [ this ] can operate the pneumatic cylinder 47 for a lift rise at the time of tape un-using it, and when [ which show a movable plate 26 to drawing 2 according to a two-dot chain line (what is shown by sign 26A) ] it is made to rotate up and only an angle floats two tape presser-foot rollers 31 and 32 from a printed circuit board 12 a little like, let it be a head non-busy condition.

[0015]

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Moreover, in case the reel shaft 27 of each head 14 is equipped with a masking tape 28, a stopper 48 is canceled and a two-dot chain line shows the cylinder supporter material 46 to drawing 2 (sign). what is shown by 26B -- like, 90 degrees is rotated, it levels and a movable plate 26 is stood perpendicularly Each head 14 can be equipped with a masking tape 28, without being barred by this by the adjoining head 14.

[0016]

Moreover, when the tape attachment direction on a printed circuit board 12 changes, the tape attachment direction of the tape attachment part of a printed circuit board 12 can be doubled with the longitudinal direction (the direction of Y) of the main part of equipment by rotating a turntable 13.

By this, the tape attachment work of the arbitrary directions of [ on a printed circuit board 12 ] is attained.

[0017]

[Effect of the Device]

Since it considered as the composition equipped with a move means to which two tape presser-foot rollers which can go up and down, the middle tape cutter of those, and these whole are moved individually to press down the masking tape which it lets out from a tape supporter and a tape supporter according to this design, although the masking tape was thinly adhesive and difficult handling, it became possible [ sticking on the part of a request of this of a printed circuit board automatically and efficiently ].

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[Translation done.]

(19) 日本国特許庁 (J P)

(12) 公開実用新案公報 (U)

(11) 実用新案出願公開番号

実開平 5 - 6 9 0 1 4

(43) 公開日 平成 5 年 (1993) 9 月 1 7 日

(51) Int. Cl.

識別記号

庁内整理番号

F I

技術表示箇所

B65H 35/07

R 9037-3F

// H05K 3/34

C 9154-4E

審査請求 未請求 請求項の数 4 (全 4 頁)

(21) 出願番号 実開平 4 - 1 7 2 5 7

(22) 出願日 平成 4 年 (1992) 2 月 2 4 日

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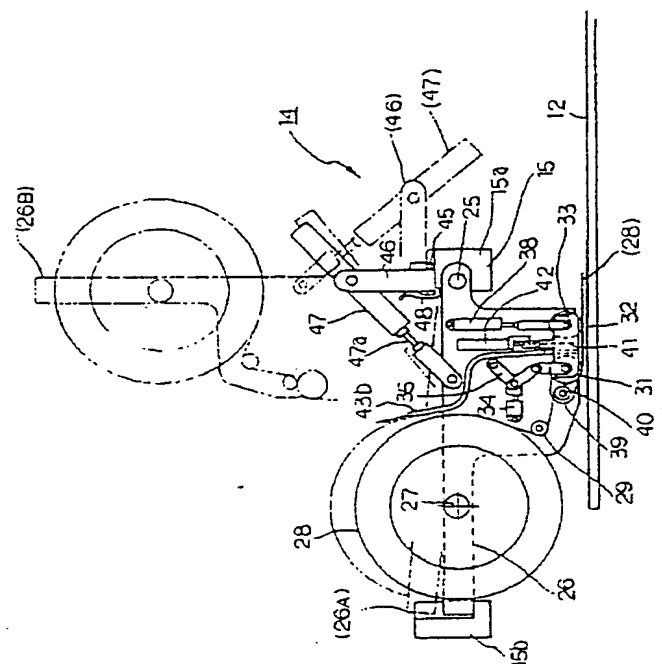
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(54) 【考案の名称】 マスキングテープ貼り付け機

(57) 【要約】

【目的】 プリント基板へのマスキングテープの貼り付け作業を能率的に行う。

【構成】 マスキングテープ 28 を装着するリール軸 27 と、リール軸 27 から送り出されるテープ 28 をプリント基板 12 に押し付ける 2 つのテープ押さえローラ 31、32 と、テープ押さえローラ 31、32 の中間のカッタ 33 とを設ける。テープ押さえローラ 31、32 は個別に昇降可能である。テープ貼り付け時に、テープはテープ押さえローラ 31、32 の下面に導かれる。テープ押さえローラ 31、32 がテープをプリント基板 12 に押し付けた状態で左方に移動するとテープがプリント基板に貼り付けられる。次いで、左方のテープ押さえローラ 31 のみを上昇させた状態でカッタ 33 を下降させ、テープを切所する。その後、次のテープ貼り付け位置へ移動する。



## 【実用新案登録請求の範囲】

【請求項 1】 プリント基板にマスキングテープを貼り付けるマスキングテープ貼り付け機であって、

ロール状のマスキングテープを回転可能に支持するテープ支持部と、

テープ貼り付け方向に並べて配置されるとともに、個別に昇降可能であり、かつ繰り出されたマスキングテープをプリント基板に押し付け可能な2つのテープ押さえローラと、

前記 2つのテープ押さえローラの間に位置し、テープ支持部側のテープ押さえローラが上昇位置にあり他方のテープ押さえローラがマスキングテープを押さえた状態でテープ切断動作を行うカッタと、

前記テープ支持部、2つのテープ押さえローラ、カッタの全体をテープ貼り付け方向に移動させる移動手段とを備えたことを特徴とするマスキングテープ貼り付け機。

【請求項 2】 前記テープ支持部と 2つのテープ押さえローラとテープカッタとを備えたヘッドをテープ貼り付け方向と直交する方向に並列して複数個設けたことを特徴とする請求項 1 記載のマスキングテープ貼り付け機。

【請求項 3】 前記複数のヘッドをそれぞれ個別に、そのテープ繰り出し方向の一端部を中心として上下に回転可能に設けたことを特徴とする請求項 2 記載のマスキングテープ貼り付け機。

【請求項 4】 前記ヘッドにロール状のマスキングテープを装着する際に、各ヘッドを回転させそのテープ支持部側が上になるように垂直に立てる手段を備えたことを特徴とする請求項 3 記載のマスキングテープ貼り付け機。

## 【図面の簡単な説明】

【図 1】 本考案一実施例のマスキングテープ貼り付け機の外観図である。

【図 2】 図 1 におけるテープ貼り付け作業を行うヘッド

の詳細図である。

【図 3】 図 2 におけるローラホルダの分解斜視図である。

【図 4】 図 2 における支持フレームの可動板受け部分の斜視図である。

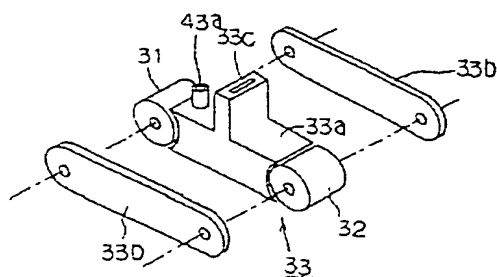
【図 5】 上記のマスキングテープ貼り付け機によるテープ貼り付け動作の説明図である。

【図 6】 従来のマスキングテープ貼り付け用の工具の斜視図である。

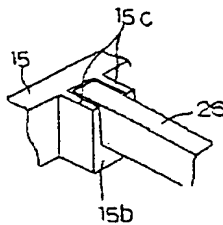
## 【符号の説明】

- 10 マスキングテープ貼り付け機
- 12 プリント基板
- 14 ヘッド
- 15 支持フレーム
- 16 可動部
- 17 可動台
- 18 可動部駆動用のモータ
- 19 レール
- 20 可動台駆動用のモータ
- 25 ピン
- 26 可動板
- 27 テープ支持部
- 28 マスキングテープ
- 31 第 1 のテープ押さえローラ
- 32 第 2 のテープ押さえローラ
- 34 第 1 のテープ押さえローラ昇降用のエアシリンダ
- 38 第 2 のテープ押さえローラ昇降用のエアシリンダ
- 41 カッタ
- 42 カッタ駆動用のエアシリンダ
- 45 ヒンジ
- 46 シリンダ支持部材
- 47 可動板回転用のエアシリンダ

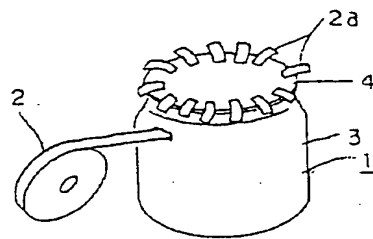
【図 3】



【図 4】

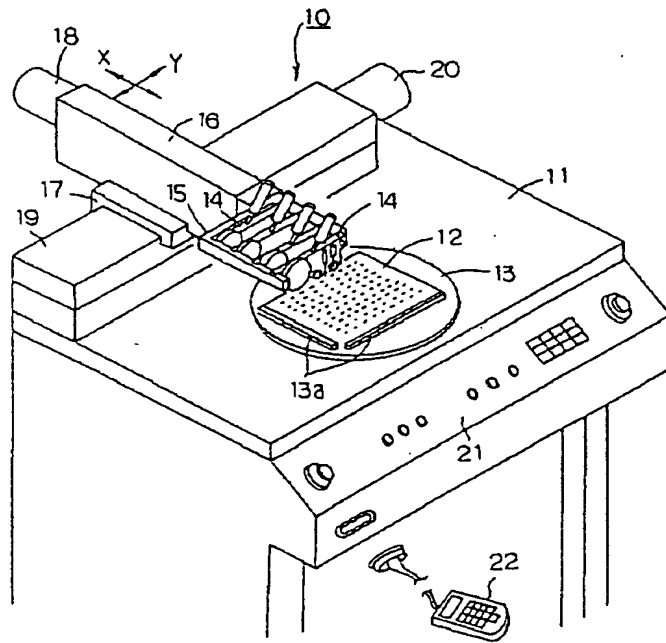


【図 6】 従来





【図 1】



【図 2】

